Abstract

The invention is related to the instrument for measuring a Raman signal of tissue, the instrument comprising a laser, a signal detection unit for measuring the Raman signal, and a fiber optic probe, wherein the fiber optic probe comprises one or more optical fibers for directing laser light onto the tissue and for collecting light that is scattered by the tissue and guiding the collected light away from the tissue towards the signal detection unit, wherein the fiber or fibers for collecting light have substantially no Raman signal in one or more parts of the 2500-3700 cm^{-1} spectral region, and wherein the detection unit records the Raman signal scattered by the tissue in said spectral region. The invention enables *ex vivo*, *in vitro* and *in vivo* analysis and diagnosis of atherosclerotic plaque and detection of tumor tissue with great advantages over current state-of-the-art technology.